CONSTRUCTION, SANITATION, AND HYGIENE

IN CHARGE OF

M. E. P. DAVIS

A DESCRIPTION OF THE PROPOSED NEW LAUNDRY OF THE UNIVERSITY OF PENNSYLVANIA HOSPITAL

WITH SPECIAL REMARKS AND EXPERIMENTS UPON DISINFECTION IN CONNECTION WITH THE WORK OF HOSPITAL LAUNDRIES*

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(Concluded)

FROM these experiments it is manifest that chemical disinfection carried on at a temperature not exceeding 100° F. is to be preferred, and that all efforts at disinfecting these articles by heat in any form whatever must necessarily result in permanently fixing the stains. If it is proposed to rinse out the stains prior to subjecting them to the disinfecting action of steam or boiling water, it is evident that the process of rinsing must be carried on at a time when some, at least, of the articles are capable of causing infection. Another advantage in favor of this method is that it does not require the employment of a disinfecting apparatus, an advantage readily appreciated by those having access to such a plant.†

For larger objects, such, for example, as mattresses or outer wearing apparel, the method of chemical disinfection is obviously not applicable, and only steam should be employed. Much has been said in regard to steam disinfection and the requirements of the apparatus designed for this purpose, but, unfortunately, it has been of such a character as to leave the impression that a steam disinfector is necessarily a complicated

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† Samples of materials of different character that have been stained with blood and with fecal matters, and subsequently treated by the chemical methods just referred to, accompanied this paper. Each sample was labelled, and the results of the various methods could be seen.

and expensive apparatus, and in order that all theoretical requirements be fulfilled perhaps it is, but a boiler-iron cylinder of the necessary capacity, placed horizontally, with swinging doors at either end, an inlet for steam at the top, and a valved outlet for air and water of condensation at the bottom will be found to answer all practical purposes providing it is intelligently operated, and no hospital laundry is complete without such an apparatus.

In size it should be capable of accommodating at least two or three mattresses or their equivalent bulk of clothing. It may be either circular, oval, or rectangular in cross-section, and should be located horizontally in a room especially provided as a disinfecting chamber. It should be provided at either end with a door that when closed can be clamped, and the joint thus practically hermetically sealed.

It should stand in the disinfecting room in such a way that only one end is accessible from the room, while the other end can only be opened from the laundry, there being no communication between the disinfecting room and the laundry except through the disinfector, which will always be closed, unless for the removal of articles disinfected or the reception of articles to be disinfected.

It is sometimes undesirable to place an apparatus of this size in operation for the disinfection of a few things from a single patient, and in this event, if heat is insisted upon as the method to be used, a covered metal caldron of forty to sixty gallons' capacity, provided with steam coils, so that the water contained in it can readily be brought to the boiling point, will be found of great convenience.

There is no doubt that some or perhaps all of these directions will be called into question because of their not taking into account certain theoretical details that are considered necessary in order that disinfection may be complete.

Disinfection as practised upon such resistant test objects as the spores of the bacillus anthracis might possibly not be complete if attempted by any of the methods that have been recommended in this paper, but it is seldom that objects of this character are to be dealt with in ordinary hospital work. The infectious agents requiring most frequent attention in hospitals, such, for example, as clothing soiled with dejections of typhoid patients, the soiled clothing from diphtheria and tuberculosis patients, and the articles from surgical cases will readily be rendered safe by any of the methods here recommended.

DISCUSSION.

DR. J. L. NOTTER, of Netley, England.—There are one or two points I should like to be very clear on, and that is the use of terms.

The term "disinfectant"—there is no more misused word than that. What do we mean by disinfectant? We mean some chemical agent which destroys specific poison. Now it is not to be confounded with an antiseptic; and the mere staining of clothing, which I take is the principal object of exhibiting these samples here, which is the result of chemical action itself, whereby albuminous substances which are thrown out in the discharge have been coagulated by the application of heat, is of little importance. The simplest method when you have a discharge to deal with is to receive the sheets or clothing into a solution of mercuric chloride, then subsequently treat the articles in the ordinary way. It is not the chemical action that causes these stains; they are simply produced by heat; it is the fixing of the albuminous compound in the infected clothing due to the discharges.

Now as to the question of disinfectants. Too much reliance has been placed upon them; that is my own personal experience. Disinfectants are good, but cleanliness is better. When I go into a hospital and smell disinfectants I am suspicious. The best destroyer of infected matter is one-half an ounce mercuric chloride, two or three ounces hydrochloric acid, and three gallons of water. The addition of hydrochloric acid prevents the mercury from doing any damage.

As to carbolic acid, I have carried on a great number of experiments. It is useful in some cases, but you must have it in not less than five per cent. solution.

I used in India for the destruction of the cholera bacilli five per cent. carbolic acid, and found it a fairly good disinfectant; but we preferred the mercury in the acid form for the typhoid.

As regards heat. Now, disinfecting chambers are not always available. Wherever they are available they should be used. Not only is it desirable for the clothing, but for the beds and bedsteads, and for everything with which the patient comes in contact that may require steam or atmospheric pressure to destroy any germs which it may contain.

These are, I think, the principal points that are dealt with. I must strongly recommend caution about accepting the results of experiments and thinking you have destroyed contagion simply because you have taken out the color. My own experiments do not lead me to place value of any consequence upon chloride of lime.

Dr. Billings.—For the disinfection of cloth, bedding, towels, and everything that can be boiled without injury the simplest and most certain method is to boil them. But if clothing soiled with blood and discharges from wounds or from the intestinal discharges be allowed to dry,

and is then put into boiling water, a permanent stain or discoloration will be produced. The articles to be boiled should go to the laundry without being allowed to dry. If soiled articles are put into cold water for two hours without any chemicals, the pigments will soak out, and then you can put them into hot water, boil them, and thoroughly cleanse them without fixing a stain.

In a great hospital receiving cases of typhus and typhoid fever and other infectious diseases the general laundry received bedding and clothing from all such cases, and these articles are washed, rubbed, and boiled together, yet there has never been a case of infection known to be traceable to the articles treated in the laundry. I believe that there is no danger of infection in a hospital laundry where everything goes in together—the clothing of the doctors, nurses, and patients. But there is a feeling of repugnance to such a mixture which I think should be recognized, and in every large laundry it is recommended, as in this paper, to have the articles of the physicians and attendants go to a separate laundry for treatment. Keep the washing of the sick person separate from the washing of the others, but not by reason of any bacteriological necessity, because it cannot be defended on that ground.

PATIENCE

NOT in the sense that we use it,
Not in the bearing of trifles,
Not merely enduring the evils
That come to our lives and distress us,
But with a far wider meaning
Comes this word PATIENCE home to us;
Showing that throughout our lifetime
Must there be strong, steady waiting;
There must be power of staying,
Regardless of things that perplex us;
Knowing this will at last bring us
Unto the goal that we long for.

—*Selected.*